

Users Guide

RAWS SIG Selector Tool

Background:

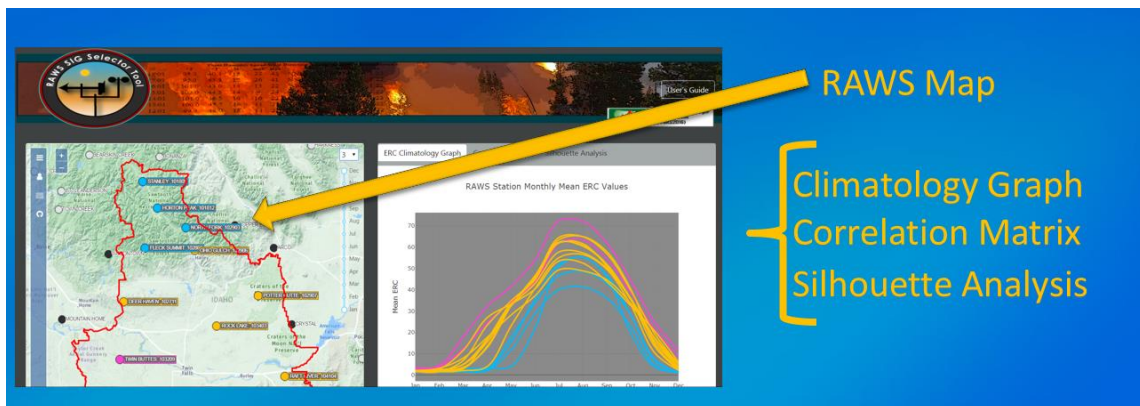
The RAWS SIG Selector Tool is designed to help users determine which RAWS to group together to represent a given FDRA. This tool shows how well the stations correlate with each other as well as provides information on the optimum number of station groupings for a given area which may inform the overall number of FDRAs or their delineations.

This tech tip will act as a user's guide for this online tool.

Data:

- Hourly RAWS data for 12 years (2006-2017) from the DRI-CEFA website was used to populate this tool. This data includes solar radiation and snowflag observations for the period of record. <https://cefa.dri.edu/raws/>
- This data was then processed through FireFamilyPlus 5.1 to calculate the 1300 ERC-Y value for all days in the period of record.

Layout: The tool is comprised of 4 data windows (RAWS Map, Climatology Graph, Correlation Matrix and Silhouette Analysis)

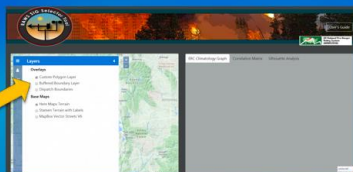


Steps to complete an analysis:

Step 1 – Select the stations

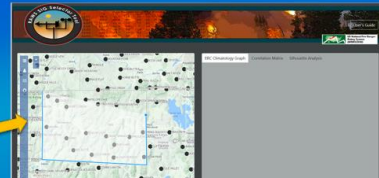
Station Selection

Users will first select the *Custom Polygon Layer* option from the Layers menu on the menu at the left of the map



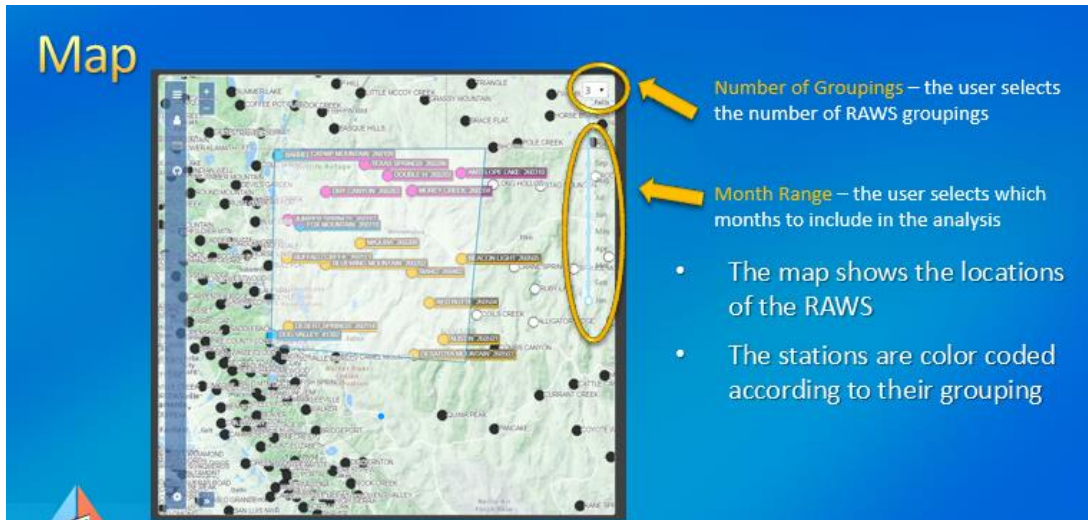
Station Selection

Users will zoom in and draw a polygon around the desired stations for the area of interest



Step 3 – Select the desired months and number of groupings for analysis

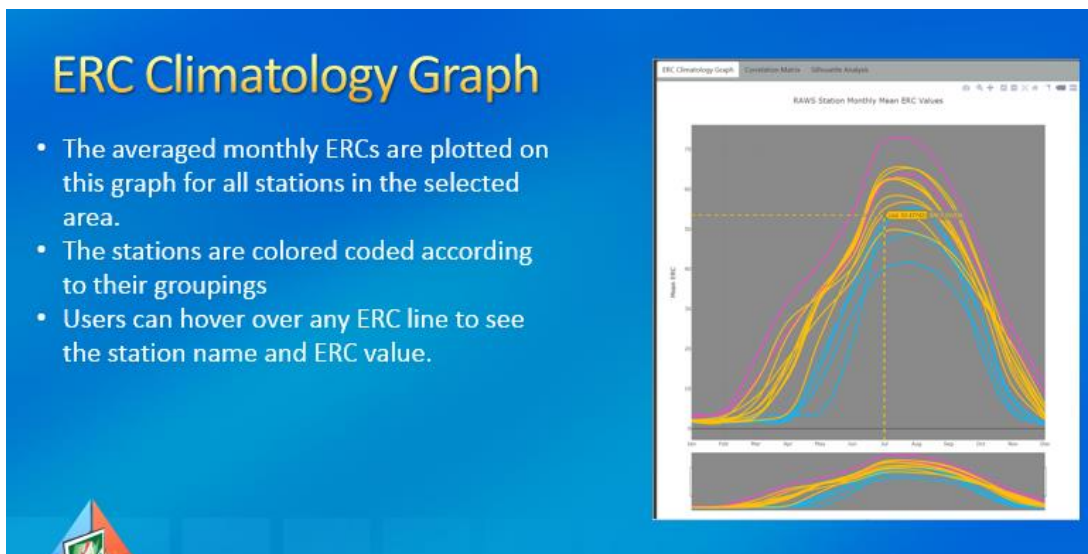
- Users can set the range of months to be included in the analysis as well as the number of station groupings. The map will color code that stations according to their best fit grouping.
- As the user changes these settings the stations colors will automatically refresh.



Results Windows:

1 - ERC Climatology Graph

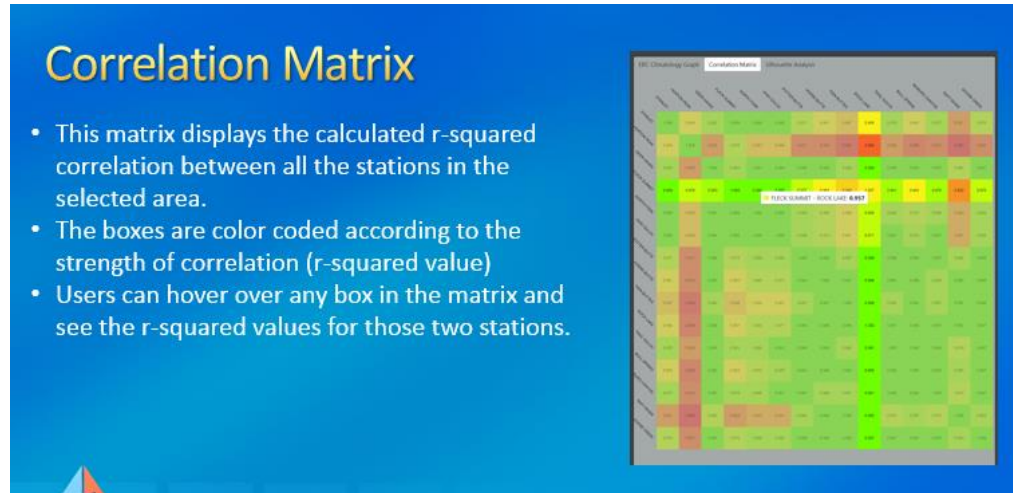
As users change the month range and number of groups the ERC Climatology graphs will automatically update.



2- Correlation Matrix

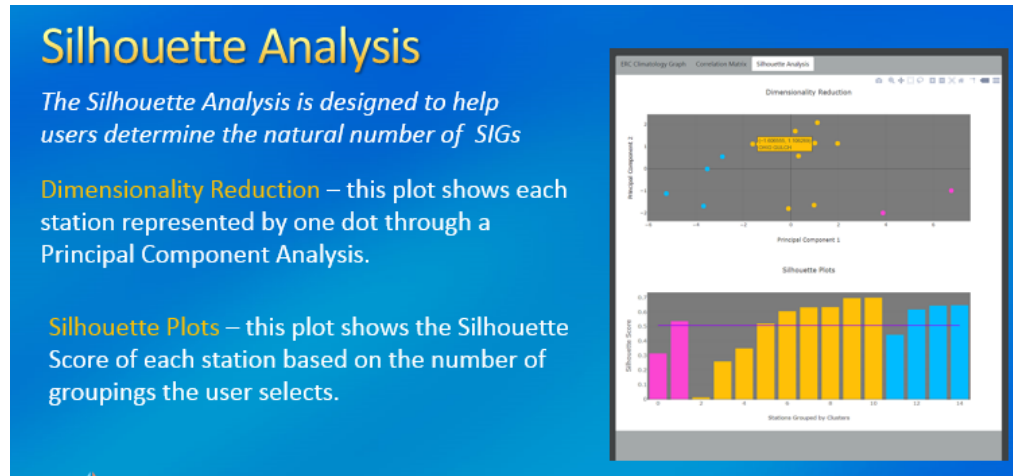
As users change the month range and number of groups the Correlation Matrix will automatically update.

- R-squared values over .9 can be considered highly correlated



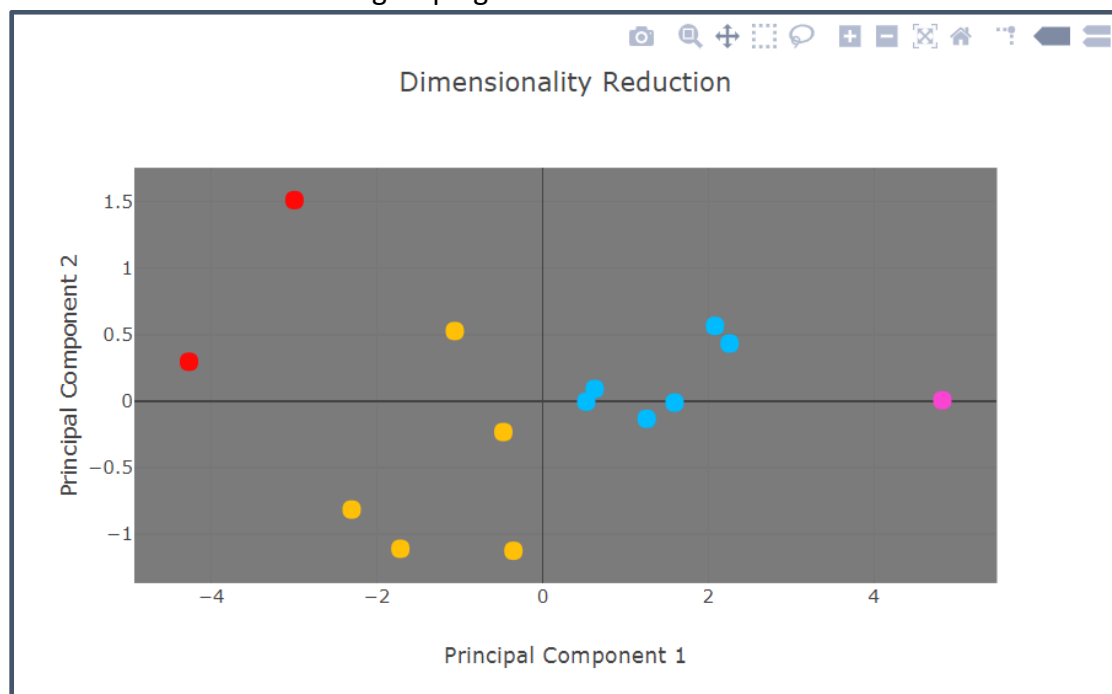
3- Silhouette Analysis

As users change the month range and number of groups the Silhouette graphs will automatically update.



Dimensionality Reduction

- The dimensionality reduction process uses a Principle Component analysis to reduce each station from 12 data points (12 months) to 2 data points (PC1 and PC2)
- PC1 and PC2 values for each station are plotted on the graph. This allows the users to visually assess the similarity (proximity) of each station to those around it.
- Stations are grouped together based on their proximity to other stations given the user defined number of groupings.



Silhouette Plots

- The Principal Component values for each station on the Dimensionality Reduction graph are used to determine the Silhouette Score.
- The Silhouette Score represents the value of each grouping. The higher the silhouette score the more valuable the grouping.
- If the Silhouette Scores becomes negative the user may have broken the stations into more groups than the data support

